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ABSTRACT

This paper attempts to clarify some of the misunderstandings which have arisen in relation to a behavior analysis of child development. Five frequent criticisms of the approach are discussed. The first concerns the confusion of behavior analysis with learning theories. Although many of the concepts of behavior analysis arose from learning theories, behavior analysis is considered a self-contained system of behavior. The second criticism concerns the lack of theoretical explanations for research results. The paper contends that behavior analysis, as a system, necessitates reliance on only observable, as opposed to hypothetical, interactions. The third criticism, concerning the passivity of the organism in this approach, is rejected on the grounds that behavior analysis conceptualizes the individual as being in constant interaction with his environment. The fourth criticism states that complex interactions cannot be analyzed through behavior analysis. It is suggested that behavior analysis is a relatively recent approach which is rapidly moving toward a rigorous analysis of complex interactions. The paper also rejects the fifth criticism which suggests that the application of the approach to child rearing, therapy or education may be harmful to the child. The discussion of this criticism centers on the misunderstanding of various details of the approach. (BD)

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Some Clarifications on the Meaning of a Behavior Analysis of Child Development[1]

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Over fifteen years ago Baer and I summarized in relatively few pages (Bijou and Baer, 1961) our conception of a behavior analysis of child development. Since then we have attempted through books (e. g., Bijou, 1976) and articles (e. g., Baer, 1970) to clarify and expand the approach. Recently we revised the first volume (Bijou and Baer, in press), elaborating on the meaning of the basic concepts, extending the coverage of complex interactions, and replacing the general formulation of B=f(s) with a field concept consisting of mutually related terms. Despite our efforts to define all of the terms functionally, and to provide numerous illustrations, many features of this behavioral approach have been misunderstood.

This paper is devoted to a clarification of some of the issues that are raised repeatedly. Since a behavior analysis of human development is a branch of a general behavior theory, my comments will frequently also pertain to general behavior theory.

Learning Theory Versus Behavior Theory of Development

A behavior analysis of child development is often regarded as a learning theory and is criticized because it attempts to explain

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all the subtleties and complexities of development in learning terms (e. g., Lerner, 1976). Inasmuch as behavior analysis has evolved from the learning theories of the 1930's and 1940's, it is understandable how this misconception has come into being.

> As learning theory developed, in the hands of men like Guthrie, Tolman, and Hull, it came to encompass more and more of the concerns of psychology as a whole. Or, better, the more it became a self-sufficient system of behavior, rather than a patchwork of unrelated facts and disconnected concepts. This is vividly apparent in the work of B. F. Skinner, in which the change was carried to its limit (Keller, 1973, p. 135).

The behavior analysis of child development is not a learning theory; it is a branch of that "self-sufficient system of behavior" called behavior analysis (Bijou and Baer, 1961). Although still on the way to becoming a mature theory, it is a comprehensive approach, including as it does, all the essential components of a system:

1. It is tied to a philosophy that postulates among other things, the subject matter of psychology is the continuous interaction between a behaving organism and physical and social events that can be objectively observed. Analyses of interactions and explanations are based on concepts derived entirely from observations. Therefore, reductionism, or the analysis of psychological

interactions in terms of biological, physical, or chemical processes, is [therefore] rejected totally.

2. It is general theory in that its functionally defined laws relate to (a) the strengthening and weakening of environment-behavior relationships (as in learning and development), (b) the evolution and devolution of behavior topographies (as in changes in abilities and skills), (c) the maintenance of behavior (as in recalling and remembering), (d) the generalization, induction, or transfer of interactions, and (e) the processes in motivation, emotion, and conflict. Complex interactions such as abilities, knowledge, intellectual behavior, personal-social behavior, problem solving, and creative behavior, are analyzed as functional sequences consisting of attending, perceiving, effective, and affecting components. (Some interactions also include a self-management phase.) Each component in these sequences in analyzed in terms of concepts and principles involving observable stimuli, responses, and setting factors, functionally defined.

3. It utilizes characteristic research methodology for investigating the behavior of an individual in relation to the specific events and setting factors that constitute his environment (e. g., Hersen and Barlow, 1976).

4. It has an explicit procedure for relating basic and applied research and for practical application (Baer, Wolf & Risley, 1968; and Skinner, 1972).

The Question of Why

Misunderstandings about the way in which a behavior analysis of development deals with explanations take at least two forms. One is the belief that the system does not answer the question "why" because it is atheoretical. Criticism of this sort usually comes from those who believe that theoretical explanations must be couched in terms of hypothetical variables in an unspecified realm (such as the mental life) or must involve presumed physiological (mostly neurological) processes. Such a conception is in keeping with the philosophy of logical positivism, which postulates that modern science has two aspects: empirical, which deals with operations on data, and explanatory, which concerns relationships among created hypothetical constructs.

> In science an observed event is said to be explained when the proposition expressing it has been logically derived from a set of definitions and postulates coupled with certain observed conditions antecedent to the event (Hull, 1943, pp. 2-3).

Behavior analysis marches to a different philosophical drumbeat. Whether it is called modern behaviorism (Bijou and Baer, 1961), interbehaviorism (Kantor, 1959), or radical behaviorism (Skinner, 1974), behavior analysis holds that statements of functional relationship do adequately answer the question "why" and rejects allegedly hypothetical explanatory accounts because

such explanations disrupt the continuity between the empirical and theoretical activities of science.

> Interbehavioral constructions, whether hypotheses, descriptions, or theories, are derived directly from the observations of actual interbehaviors (Kantor and Smith, 1975, p. 417).

The other kind of misunderstanding of the way explanations work in behavior analysis is the assertion that causation is either an antecedent condition, as in respondent interactions and cognitive psychology (with feelings and states of mind occurring prior to behavior), or a consequent condition as in operant interactions. In fact, this system does not consider a stimulus condition, antecedent or consequent to a response, to be the cause of a response; a stimulus condition is viewed as one of the events in a multiplex field. One seeks not <u>the</u> cause of behavior but the past interactions that have led to changes in relationships among stimuli, setting factors, and responses that constitute the situation under study.

Generally we are not in a position to trace an individual's history in order to specify the cumulative effects of successive changes over time. (We do this in limited ways in experimental studies.) Instead, we analyze an interaction at a given time in a given situation. Through careful and systematic observation and experimentation we learn something of the consequences of a

child's interactional history, that is, we learn what the specific events in his functional environment mean to him or her. This analysis of causation, often referred to as systematic causation (Lewin, 1936), takes into account all of the conditions that can be identified and functionally related to the behavior change under study.

So we see that behavior analysis answers the question of "why" in terms of relationships among functionally defined variables, a practice entirely in keeping with one of the definitions of theory: the general or abstract principles of any body of facts.

The Passivity of the Individual Organism and the Nature of the Environment

It is often said that a behavior analysis of human development views the child as a passive organism, one who contributes little or nothing to his/her own development. For example:

> Human beings are thus seen as passive; to behave they must be stimulated. Hence, as opposed to organismic conceptions of developmental functioning, the person is not seen as playing an active, contributory role in his or her own development (Lerner, 1976, p. 279).

> The learning theorists see the child as molded by the environment and do not assume any particular direction to development (Mussen, Conger and Kagan, 1974, p. 65).

This impression is probably based on a confusion between classical behavioristic psychology and modern behavior analysis. Classical behavioral psychologists such as Watson (1930) clearly took the position that the organism is passive:

> So we see that the organism is constantly assailed by stimuli--which come through the eye, the ear, the nose, and the mouth--the so-called objects of the environment; at the same time the inside of our body is likewise assailed at every moment by stimuli arising from changes in the tissues themselves (p. 12).

In contrast, modern behavior theory considers both the organism and the environment to be active, and emphatically maintains that the two comprise an inseparable, interdependent unit. In 1943, Hull unequivocally stated his position on the relationship between the organism and the environment:

> At the outset of the independent life of an organism there begins a dynamic relationship between the organism and its environment. For the most part, both environment and organism are active; the environment acts on the organism, and the organism acts on the environment. Naturally the terminal phase of any given environmental-organismic interaction depends upon the activity of each: rarely or never can the activity of either be predicted from knowing the be-

havior characteristics of one alone (p. 16).

And Skinner (1969) in discussing the passing into history of stimulus-response psychology, says:

> A stimulus is no longer merely the conspicuous onset or termination of an energy exchange, as in reflex physiology; it is any part of the occasion in which a response is emitted and reinforced...In other words, we no longer look at behavior and environment as separate things or events but at the interrelation among them (p. 10).

Kantor and Smith (1975) further emphasize the mutuality of the stimulus-response relationship:

> Stimuli and responses are reciprocal factors in a behavior segment. One cannot occur without the other. Probably the best way to describe a response is to say that it is something that the organism and the stimulus object do with respect to each other. The organism performs some action or movement. The stimulus, on the other hand, is an action or an operation performed by the object with respect to the organism with which it interacts. This stimulus action or stimulation can be best defined as the mutual and corresponding behavior of an object in an interactional field along with the action performed by the organism

(pp.31-32).

Perhaps if we spell out in detail the modern behavioristic concept of the child, the environment, and the interaction between them, we shall be able to describe the behavior analysis stance on the passivity of the child.

The child is conceptualized as a unique constellation of stimuli and responses. The responses of a human being have certain capacities characteristic of his species, including verbal interactions. These responses are in continuous interaction with the internal and external stimuli that constitute his or her functional environment. The unique and general features of a constellation of variables result from one's genetic and personal history. The general interactional traits of an individual are genetically constructed so that some classes of his responses are influenced by preceding stimulation (respondent interactions), some by consequent stimulation (operant interactions), and some by both preceding and consequent stimulation. In natural settings, stimuli often relate simultaneously to respondent and operant behavior. The approach of a vicious looking dog may increase one's respiration and heart rate (respondent behavior) and increase the probability of running in the opposite direction (operant behavior).

The environment, on the other hand, is composed of specific stimuli and setting factors that interact with a child. Note that

this is a functional definition of the environment, referring, as it does, to events that interact with a child. Specific stimuli and setting events, whether from internal or external sources, are described both in terms of their physical and their functional dimensions. In the course of philogenises and ontogenises specific stimuli acquire multiple functions, as, for example, a reinforcing function, which increases the probability of occurrence of a preceding behavior, or as a discriminative function which signals for a change in behavior. Setting factors are contextual conditions that alter the functional properties of all of the stimuli and responses in an observed interaction, such as the deprivation of food (an organismic setting factor), a prolonged anger reaction (an emotional setting factor), or the religious atmosphere of a church service (a social setting factor).

In this kind of thorough-going interactional system, a child influences the course of his own development in at least two ways: (a) to each interaction, he contributes the responses and the internal stimuli, the characteristics of which are determined by his genetic and personal histories, and (b) as he develops he responds more and more to specific stimuli and setting factors that are brought about by his own behavior, as in self-management. To argue that a child participates in directing his own development does not mean that he inherently strives to achieve some idealized goal, such as Roger's complete self-actualization (Jersild, 1960)

or Piaget's formal operational stage of intellectual development (Mussen, Conger, and Kagen (1974).

Analysis of Complex Interactions

One sweeping and presumably devastating criticism of a behavior analysis of development is that it cannot deal with complex interactions, particularly language. It is true that at the present time this approach cannot deal adequately with all complex interactions. What system does? Aside from the question of the adequacy of the current systems, behavioral psychologists themselves are taking different paths which they hope will lead to acceptable analyses of all the complexities of human development.

One tactic is to alter the postulates of behaviorism, admitting inner determiners in the form of hypothetical cognitive constructs. Bandura (1977) is an example.

> If human behavior could be fully explained in terms of antecedent inducements and response consequences, there would be no need to postulate any additional regulatory mechanisms. However, most external influences affect behavior through intermediary cognitive processes. Cognitive factors partly determine which external events will be observed, how they will be perceived, whether they leave any lasting effects, what valence and efficacy they have, and how the information they convey will be organized for future use.

> By manipulating symbolically the information that is derived from experience, one can comprehend events and generate new knowledge about them (p. 160).

Another maneuver is to use behavior theory to explain simple interactions, particularly "habits", and use cognitive, psychoanalytic, or client-centered theories to analyze complex interactions specially those classified as social and emotional.

The third strategy, the one compatible with behavior analysis, is to postulate that scientific progress will best be served by moving from simple to complex interactions, from known relationships to unknown relationships (Skinner, 1947). It assumes that any data-based, young science is limited in what it can accomplish at the outset. However, as it develops, it expands its domain: as theoretical formulations are advanced and as functional relationships are experimentally demonstrated, new concepts and empirical laws are incorporated into the system, enabling it to cope more and more effectively with complex interrelationships. Thus, in the early years of behavior analysis, much of the research and application in child development were extrapolations from the animal laboratory, focusing on learning and adjustment problems of young normal, retarded, and emotionally disturbed children. Now one sees the beginnings of research on a wide range of subjects and on a variety of complex interactions including thinking and problem solving (e. g., Skinner, 1969 and Grimm,

Bijou, & Parsons, 1973), creative behavior (e. g., Holman, Goetz, & Baer, 1977), conceptualizing and abstracting behavior (e. g., Schilmoeller & Etzel, 1977), early moral development (Bijou, 1976) and self management (Ballard & Glynn, 1975).

If one were to accept the position that behavior analysis has had ample opportunity over the past 25 years or so to demonstrate that it can analyze complex human behavior, and has repeatedly failed in its efforts, it would be fair to instigate changes in its basic assumptions as, for example, admitting hypothical cognitive structures and processes or to move toward theoretical electicism. But such changes are not indicated because the approach has greatly stimulated basic and applied research and is rapidly moving toward a rigorous analysis of complex relationships in laboratory and natural settings (Kazdin, 1975). Considering that it has taken several thousand years, at least since the time of Aristotle, to arrive at this natural science conception of psychology--behavior analysis--it should be given ample opportunity to demonstrate its full potential.

Applications

It has been said that the application of behavior analysis to child rearing, early education, and child therapy may have harmful effects. This is true for the practical application of any scientific finding when the applier is not adequately trained to perform the task. To prevent the misuse of scientific knowledge,

there must be professional and legal guidelines that include carefully defined standards of training and experience for those who aspire to qualify as practitioners.

But the quality control of personnel is not the issue here: the issue is that once again criticisms of applied behavior analysis generally have been based on misunderstandings of a behavior analysis of child development. We shall deal with three such misconceptions: (a) the limitation of the approach for treatment, (b) the concept of learned motivation, and (c) the absence of any reference to inherent developmental end-states.

According to Katz (1972), it is dangerous to use conditioning procedures to ameliorate a problem without first determining what has caused the problem. She goes on to say that if the cause of the problem is a learning difficulty, it is all right to use conditioning procedures; if, however, the cause is emotional, one should use other procedures such as psychoanalysis or client-centered therapy. This kind of dichotomy and admonition reminds one of the practice followed in the heyday of the mental health "team": educational and intellectual problems were diagnosed and treated by psychologists using "psychological" procedures, and emotional problems by psychiatrists using "psychiatric" procedures. This so-called treatment guideline does not recognize, first, that in applied behavior analysis, problems labeled as emotional are diagnosed and treated with the same logic and methodology as

problems involving deficiencies in skills and knowledge; and, second, that emotional behavior, as well as intellectual and moral behavior are analyzed as interactional sequences in specific situations. The assumption that a child can be fractionated into intellectual and emotional components and each treated separately is incompatible with this approach.

The second misconception--that of learned motivation--pertains mainly to the use of contrived reinforcers in practical situations such as the classroom (e. g., Levine and Fasnacht, 1974). The criticism is that contrived reinforcers in the form of points or tokens may make the child dependent on the procedure, particularly on the behavior of the teacher, and may restrict learning with tokens to learning for tokens--no token, no learned response. Certainly these consequences are possible, but the practitioner who knows his business as he should, (a) would use contrived reinforcers only with children who do not respond to the usual reinforcers (e. g., praise); (b) would include in the instructional or therapy program increasing interval or ratio schedules of reinforcement so as to promote independence from the teacher or therapist; and (c) would use a percentage schedule of reinforcement (one in which natural reinforcers are gradually faded out) so that the child not only makes progress toward the desired goal but also acquires new study skills as well as an appreciation for a new conditioned reinforcer (Kazdin & Boozin, 1972).

The target of the third criticism is the theory itself: it ignores the developmental stages of hypothetical entities such as cognitive structures or psychosexual phases, and for that reason it does not give direction to training and treatment; it does not, for example, describe the intermediary and ultimate stages of intellectual functioning or of self-actualization. True enough. The theory does not include idealized developmental goals and subgoals and there is no prospect that it will be modified to do so, for in accordance with its philosophy, the goals of education and treatment are cultural, not theoretical, matters. The goals are objectives that should be based on the physical and behavioral characteristics of a child, the educational and treatment opportunities afforded him, and projections of the future development of society (Bijou, 1976), and should be established by those persons concerned with the child's education and treatment: the parents, teacher, therapist, school administrator, and so on. They are the ones who must cooperatively make decisions about the desirable end-states of education and treatment. By making such decisions they are, in a sense, indicating their beliefs about the features of the culture that they wish to perpetuate. The approach does not neglect the goals of education and treatment; it simply takes them out of the realm of developmental theory and places them in the activities of the culture. Can it be that theories which include hypothetical developmental end-states, such as cog-

nitive and psychoanalytical theories, have been readily accepted because they relieve parents, teachers, therapists, and others from taking on this important responsibility?

The increasing flow of articles and books dealing with behavior analysis and applied behavior analysis (e. g., Drash and Freeman, 1973) is a convincing indication that this approach is proving to be effective in dealing with parent-child relationships, early educational practices, and child treatment procedures. It is likely to be even more effective in the future if practitioners continue to adhere to the postulates of a natural science, apply only those concepts and principles that are firm parts of the general theory, and continue to support and encourage rigorous basic and applied research.

Summary and Conclusion

Fifteen years after its presentation, the behavior analysis of child development continues to be misunderstood for reasons that are difficult to discern. Some misunderstanding probably originates in a confusion between classical (Watsonian) behaviorism and modern behaviorism, some in a fusing of the current varieties of modern behaviorism (e. g., methodological, radical, and cognitive), and some in the opposing conceptions of psychology as science. If these are indeed possible sources of misunderstanding, one is obliged to try to improve communication by clarifying differences and by examining some of the recurring criticisms.

Classical behaviorism may be described, among other things, as mechanistic, physicalistic, reductionistic, and environmentalistic. On the other hand, behavior analysis is functional, nonreductionistic, interactional, and situational. With regard to fusing the contemporary behaviorisms, problems arise because basic differences in postulate sets are overlooked, especially those bearing on the inclusion or exclusion of non-observable constructs. Since behavior analysis excludes non-observable terms, it may legitimately be grouped with radical behaviorism and interbehaviorism but not with methodological and cognitive behaviorism. To ignore this distinction among contemporary behaviorisms is to make a grievous error.

With regard to opposing views of psychology as a science,

there are those who argue that psychology requires a unique conception of science because it alone deals with "the mental life," while others, including behavior analysts, maintain that psychology is homegeneous with the other natural sciences because its subject matter is the interactions of organisms with environmental conditions. Physical scientists observe and study the interactions of physical systems; biological scientists observe and study the interactions of organs and physiological systems; and psychological scientists observe and study the observable interactions of total organisms with events that constitute their functional environments.

And with regard to specific, recurring criticisms, we isolate the following five for comment:

1. The behavior analysis of child development is frequently classified as a learning theory and is criticized for attempting to explain all behavior in learning terms. Although many of its concepts originate in the experimental learning literature, behavior analysis is a system of behavior. That is to say, it has an articulate philosophy of science, it is part of a general theory of behavior, it has a core research methodology, and it has rules for relating basic and applied work. As a system of behavior, it is designed to deal with all interactions - intellectual, social, motor, and emotional. Architecturally, it is a more complete psychological approach than the Piagetian theory which focuses on the evolution of cognitive functions and the Freudian theory which

centers on psychosexual progressions.

2. Behavior analysis of child development does not adequately explain its research findings. The argument goes that the approach is all right as a first step in analysis but falls short of providing explanation in terms of hypothetical constructs or physiological conceptualizations. This contention overlooks the postulate set of the system which rejects non-observable concepts and holds that organism-environment interactions are adequately interpreted in terms of past and present observable interactions.

3. The behavior analysis of human development conceptualizes the child as a passive organism, one who contributes little or nothing to his/her own development. This view is not in keeping with the formulation: the child is conceptualized as a constellation of stimuli, setting events, and responses in continuous interaction with his/her functional environment. The child and the environment are always active, and maintain a symbiotic relationship. The child influences his/her development (a) by contributing responses, stimuli, and setting events to ongoing interactions, the properties of which are determined by his/her genetic and personal histories, and (b) by altering the environment, as in self-management interactions.

4. Behavior analysis of human development cannot analyze complex interactions, particularly language. It is true that <u>at present</u>, because of its relatively recent origin, the system is

not yet able to analyze all forms of complex human interactions. The strategy for advancement is to move from simple to complex analyses at a pace dictated by research findings. The literature clearly indicates that steady progress is being made in analyzing increasingly complex interactions such as early moral development, intellectual behavior, and creative behavior.

5. The application of behavior analysis to child rearing, early education, and child therapy has harmful effects. The practical application of any scientific finding may have detrimental effects when the application is premature and when proper social, legal, and ethical safeguards are not instituted. However, the issue is not the adequacy of social controls on scientific application, but the misunderstanding of the details of the theory applied. For example, criticisms claiming that applied behavior analysis is suitable for only certain kinds of problem behavior, or that the motivational techniques used in some remediation are too specific to be helpful outside of the treatment situation, do not take into account that in helping a child reach his/her educational or treatment goal, all components of the theory should always be systematically applied in accordance with the specific prevailing conditions and the objections.

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Footnote

1. Based on an invited address given at the Third Annual Midwestern Association of Behavior Analysis, Chicago, May, 1977.